285 Preliminary report of longitudinal changes in bone mineral density (BMD) in children and adolescents with CF

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Introduction Confounding factors complicate the interpretation of DXA scans in children and adolescents. Neither the best therapeutic interventions for poor BMD nor the optimal time to intervene are known.

Aim: To increase understanding of the natural history of BM accrual by investigating longitudinal changes in BMD.

Method: BMD at L2-L4 site was measured by DXA (GE-Lunar Prodigy). Patients who have had at least 2 scans >1 yr and <3 yrs apart, with the initial scan between 10 and 16 yrs were included. Transplant patients and those commenced on testosterone or bisphosphonates were excluded. Annual BMD accrual and the mean age between scans were calculated.

Results: 51 (25M) patients had 157 DXA scans. Median age at the first scan was 13 yrs (10.2–15.6) M and 12.7 yrs (10–15.6) F. Median time to follow-up scan 1.5 yrs (1–3) M, 1.4 yrs (1–3) F. 79 (44M) annual BM accrual rates (g/cm^2) were calculated.

Males: 10–16 yrs 0.046 (–0.028 to 0.178), 10–13.9 yrs 0.019 (–0.028 to 0.105), 14–16 yrs 0.059 (–0.006 to 0.178).

Females: 10–16 yrs 0.065 (–0.034 to 0.167), 10–12.9 yrs 0.037 (–0.03 to 0.121), 13–16 yrs 0.087 (–0.034 to 0.167)

More rapid accrual occurred between 14–16 yrs (M) and 13–15 yrs (F). 9 (6M) had negative accrual rates. Mean annual changes in BMD Z score and BMAD Z score were –0.29 and –0.17 (M), and 0.038 and 0.095 (F) respectively.

Conclusion: These data show a delayed puberty effect. Boys had inadequate, and girls normal, annual gain in BMD compared to healthy adolescents. There was a wide range of BM accrual with some children showing an annual loss. Boys had a negative annual change in BMD Z scores even when adjusted for body size. Our results suggest that the gender differences in adult BMD status begin at least in early adolescence and emphasise the need for longitudinal monitoring of bone status.

286 Renal disease in cystic fibrosis (CF) patients: a prospective multicenter observational cohort study

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The aims of the study were to assess renal disease (glomerular and tubular injury), to define lithiasis risk factors, to exert possible renal damage cascades and pathogenic relationships in 2 French CF centers patients investigated through a prospective 10 months observational cohort study.

Methods: 38 patients (19 males, 19 females, ranging 4 to 41 years), in 2 groups <20 years (n=18), >20 (n=20) from Lisieux and Caen. Electrolytes, BUN, creatinin, magnesiemia, albuminuria, uric acid, calcemia, phosphoremia, vitamin D level, glycosylated HB, urinary electrolytes, proteinuria, microalbuminuria, hematuria, creatinin clearance, glycosuria, beta 2 microglobulin, phosphorus reabsorption rate, calciuria, oxaluria, uricuria, citraturia, cristalluria and urinary Ph; renal ultrasound (kidney volume, echogenicity, calcifications, lithiasis) were performed in all patients.

Results: (1) Glomerular function: no glomerular filtration rate abnormalities could be found. (2) Proteinuria: values >0.1 mg/l were found in 6 patients (15.7%); age correlation, p=0.1088. (3) Microalbuminuria: in 4 patients (10.7%) albuminuria correlated. (4) Lithiasis and risk factors: hypocitraturia (36.8%), hyperoxaluria (23.7%), hypercalciuria (13.1%), hypomagniesemia (13.1%), cristalluria (35%) were found in our patients in significant %.

Oxalate crystal presence was correlated with D vitamin level (p=0.0348).

Conclusion: renal injury (microalbuminuria, albuminuria) is present in CF patients increasing with age with significant relationship, without gender or genotypic prevalence; there are clearly identified lithiasis risk factors (hypercalciuria, hypocitraturia, hyperoxaluria) which have to be taken into account to protect renal function likely to be concomitantly hazarded by other potentially nephrotoxic therapeutic approaches (NSAID, repeated IV high dosage aminoglycosides courses, immunosuppressive drugs).

287 Renal function and urolithiasis in Cystic Fibrosis

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Although CFTR is expressed in the kidney, patients with cystic fibrosis (CF) have not been reported to have major renal abnormalities with the exception of urolithiasis.

The aim of this study was to determine renal function and the potential risk factors for renal stone formation in CF patients older than 10 years of age. The findings of metabolic evaluation of 4 CF patients having confirmed urolithiasis (mean age: 22.37±5.78) were compared with those of 27 CF patients without urolithiasis (mean age: 24.25±4.03) and those of 10 healthy volunteers (mean age: 22.13±4.98). Evaluation included plasma sodium (Na), potassium (K), chloride, BUN, creatinine, uric acid, calcium (Ca), phosphorus (P), magnesium (Mg) and parathormone (PTH). Twenty-four hour urine collection for creatinine, uric acid oxalates, Ca, Mg, K^+, Na^+ and microalbuminuria was also performed. Glomerular filtration rate (GFR) was calculated and fresh urine samples were examined for the presence of crystals, erythrocytes, glycosuria and microorganisms. Patients with CF and urolithiasis showed significantly increased values of BUN (p: 0.012), PTH (p: 0.018) and GFR (p: 0.003), very low urine Mg levels (p: 0.014) and microalbuminuria (p: 0.034) as compared to CF patients without urolithiasis. There was no correlation of urolithiasis with hypercalciuria and hyperoxaluria. Furthermore, all CF patients showed significantly increased PTH levels (p: 0.032), very low urine Mg levels (p: 0.024) and microalbuminuria (p: 0.024) as compared to healthy volunteers.

Conclusions: Renal dysfunction was demonstrated in older CF patients, probably, secondary to the primary defect of renal chloride channels. Extracellular volume regulators, such as hormones, may also be implied. Urolithiasis may be the result of renal dysfunction.

288 Assisted reproductive technique in men with Cystic Fibrosis

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Sterility in men with cystic fibrosis (CF) raises the question of ART. We report the results of assisted reproductive technique (ART) in 23 patients from 1994 to 2004. All were azoospermic. Their median age was 29 (21–41) years, the median age at diagnosis was 3 (0–39) years, 19 patients (76%) had pancreatic insufficiency, 17 patients (68%) had bronchial colonization with *Pseudomonas aeruginosa*. Mean FEV1 was 47.8±24.4% pred, body mass index was 19.7±2.4 kg/m^2. 11 men (48%) were F508del homozygous and 15 men (65%) had severe genotype. No CFTR mutations have been detected in their partner and genetic counseling has been provided to all couples.

Two had AID (one delivery). Sperm was surgically retrieved in 21 patients and ICSI performed in 19. Pregnancies occurred in 12 of these 19 couples (63%), (2 ectopic pregnancies, 2 spontaneous abortions, one termination of pregnancy for polymalformed twins and 11 single deliveries in 9 couples). Two couples tried AID after ICSI failed, one had twins; another adopted a child, and two had a spontaneous pregnancy. After a follow-up of 4.1±2.3 years, two patients died, two underwent lung transplantation and 19 remained stable.

ART can help men with CF to become a father, but their health status and short survival need careful counseling and multidisciplinary medical care.